

## WHAT IS CLAIMED IS:

1. An anti-bacteria, anti-viral, and anti-fungus composition, which includes the following ingredients:

(A) a metal ionic compound having catalytic function, which has a general formula

- 5  $M^{+a}X^{-b}$ , in which M is a metal element selected from the group consisting of Ni, Co, Mg, Mn, Cr, Ca, Fe, Cu, Ti, Al, Sb, Sn, Pb, Zn, Pt, Pd, Os, Ru, Cd, Rh, and Ir, or M is  $NH_4$ ; X is an anionic group selected from the group consisting of fluoride, chloride, bromide, iodide, nitrate, sulfate, sulfite, acetate, oxalate, carboxylate, succinate, phosphate, pyrophosphate, percholate, gluconate, ascorbate, ethylenediamine  
10 tetraacetate, formate, and lactate; a is an integer of from 1 to 6; and b is an integer of from 1 to 6;

(B) an ionic compound, a sulfur compound, a coenzyme having reducing ability, or an agent having oxidizing ability; and

(C) an additive having a general formula  $RY_z$ , in which R is an element selected from

- 15 the group consisting of Li, Na, K, Mg, Ca, and Zn; Y is selected from the group consisting of chloride, nitrate, sulfate, carboxylate, carbonate, bicarbonate, phosphate, dihydrogen phosphate, hydrogen phosphate, and oxalate; and z is one or two;  
wherein the weight ratio of ingredients (A):(B):(C) is 1: 10-50: 1500-3000.

2. The anti-bacteria, anti-viral, and anti-fungus composition according to claim 1,

- 20 wherein the ingredient (B) is an ionic compound having a general formula  $NX$ , in which N is an element selected from the group consisting of Li, Na, and K; X is an anionic group selected from the group consisting of fluoride, chloride, bromide, iodide, nitrate, sulfate, sulfite, acetate, oxalate, carboxylate, succinate, phosphate, pyrophosphate, percholate, gluconate, ascorbate, ethylenediamine tetraacetate,  
25 formate, and lactate.

3. The anti-bacteria, anti-viral, and anti-fungus composition according to claim 1,

wherein the ingredient (B) is a sulfur compound having a general formula RSH, in which R represents C<sub>1</sub>-C<sub>6</sub> alkyl group, aryl group, and aralkyl group.

4. The anti-bacteria, anti-viral, and anti-fungus composition according to claim 3, wherein the sulfur compound is selected from the group consisting of cysteine,

5 reduced glutathione, dithiothreitol, and homocysteine.

5. The anti-bacteria, anti-viral, and anti-fungus composition according to claim 1, wherein the ingredient (B) is a coenzyme having reducing ability, which is selected from the group consisting of reduced flavin mononucleotide (FMNH<sub>2</sub>), reduced flavin adenine dinucleotide (FADH<sub>2</sub>), reduced nicotinamide adenine dinucleotide (NADH),

10 and reduced nicotinamide adenine dinucleotide phosphate (NADPH).

6. The anti-bacteria, anti-viral, and anti-fungus composition according to claim 1, wherein the ingredient (B) is an agent having oxidizing ability, which is selected from the group consisting of hydrogen peroxide and quinones.

7. The anti-bacteria, anti-viral, and anti-fungus composition according to claim 1,

15 which is formulated as a spray, aerosol, and a film.

8. The anti-bacteria, anti-viral, and anti-fungus composition according to claim 1, which is used in household, vehicle, hospital, school, restaurant, hotel, internet coffee shop for applying to filter of air-conditioner, tap, stool, interior of elevator and its keyboard, and for applying to human beings.

20 9. A method for producing an anti-bacteria, anti-viral, and anti-fungus composition according to claim 1, which includes the step of mixing the following ingredients:

(A) a metal ionic compound having catalytic function, which has a general formula M<sup>a</sup>X<sup>b</sup>, in which M is a metal element selected from the group consisting of Ni, Co, Mg, Fe, Cu, Mn, Cr, Ca, Ti, Al, Sb, Sn, Pb, Zn, Pt, Pd, Os, Ru, Cd, Rh, and Ir, or M is

25 NH<sub>4</sub>; X is an anionic group selected from the group consisting of fluoride, chloride, bromide, iodide, nitrate, sulfate, sulfite, acetate, oxalate, carboxylate, succinate,

phosphate, pyrophosphate, percholate, gluconate, ascorbate, ethylenediamine tetraacetate, fumarate, and lactate; a is an integer of from 1 to 6; and b is an integer of from 1 to 6;

(B) an ionic compound, a sulfur compound, a coenzyme having reducing ability, or an

5 agent having oxidizing ability; and

(C) an additive having a general formula  $RY_z$ , in which R is an element selected from the group consisting of Li, Na, K, Mg, Ca, and Zn; Y is selected from the group consisting of chloride, nitrate, sulfate, carboxylate, carbonate, bicarbonate, phosphate, dihydrogen phosphate, hydrogen phosphate, and oxalate; and z is one or two;

10 wherein the weight ratio of ingredients (A):(B):(C) is 1: 10-50: 1500-3000.

10. The method according to claim 9, wherein the ingredient (B) is an ionic compound having a general formula  $NX$ , in which N is an element selected from the group consisting of Li, Na, and K; X is an anionic group selected from the group consisting of fluoride, chloride, bromide, iodide, nitrate, sulfate, sulfite, acetate, 15 oxalate, carboxylate, succinate, phosphate, pyrophosphate, percholate, gluconate, ascorbate, ethylenediamine tetraacetate, fumarate, and lactate.

11. The method according to claim 9, wherein the ingredient (B) is a sulfur compound having a general formula  $RSH$ , in which R represents  $C_1$ - $C_6$  alkyl group, aryl group, and aralkyl group.

20 12. The method according to claim 11, wherein the sulfur compound is selected from the group consisting of cysteine, reduced glutathione, dithiothreitol, and homocysteine.

13. The method according to claim 9, wherein the ingredient (B) is a coenzyme having reducing ability, which is selected from the group consisting of reduced flavin mononucleotide ( $FMNH_2$ ), reduced flavin adenine dinucleotide ( $FADH_2$ ), reduced 25 nicotinamide adenine dinucleotide (NADH), and reduced nicotinamide adenine

dinucleotide phosphate (NADPH).

14. The method according to claim 9, wherein the ingredient (B) is an agent having oxidizing ability, which is selected from the group consisting of hydrogen peroxide and quinones.